Aircraft Noise Control and the Role of Federal Research

Presentation by

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to

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Aircraft Noise Control

Aircraft Noise Certification

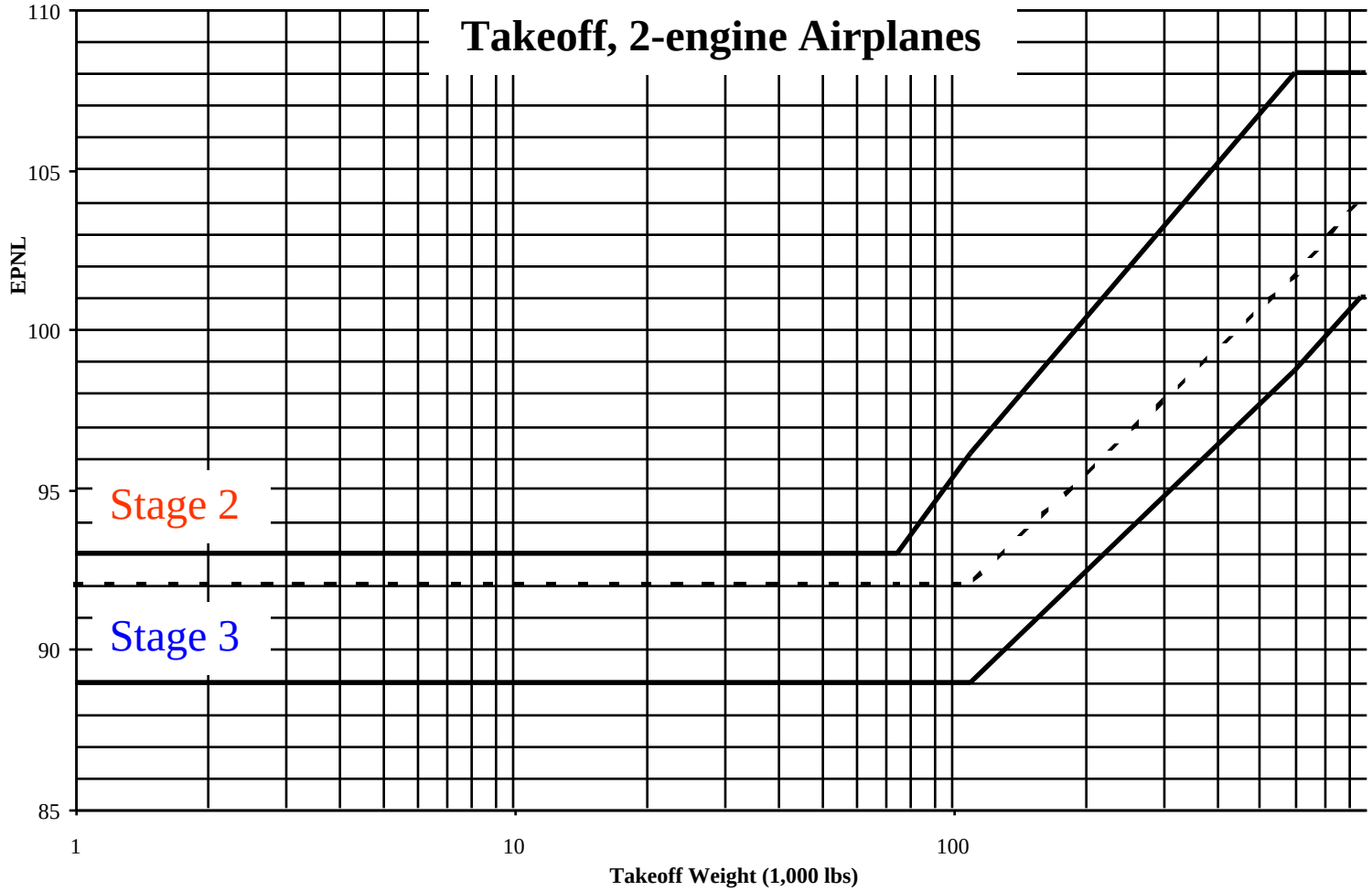
- FAR part 36
- ICAO Annex 16, Volume I

Airport Land Use Compatibility

- FAR part 150

U. S. Standards

NOISE CERTIFICATION REQUIREMENTS - JET AND TRANSPORT AIRPLANES



International Practices

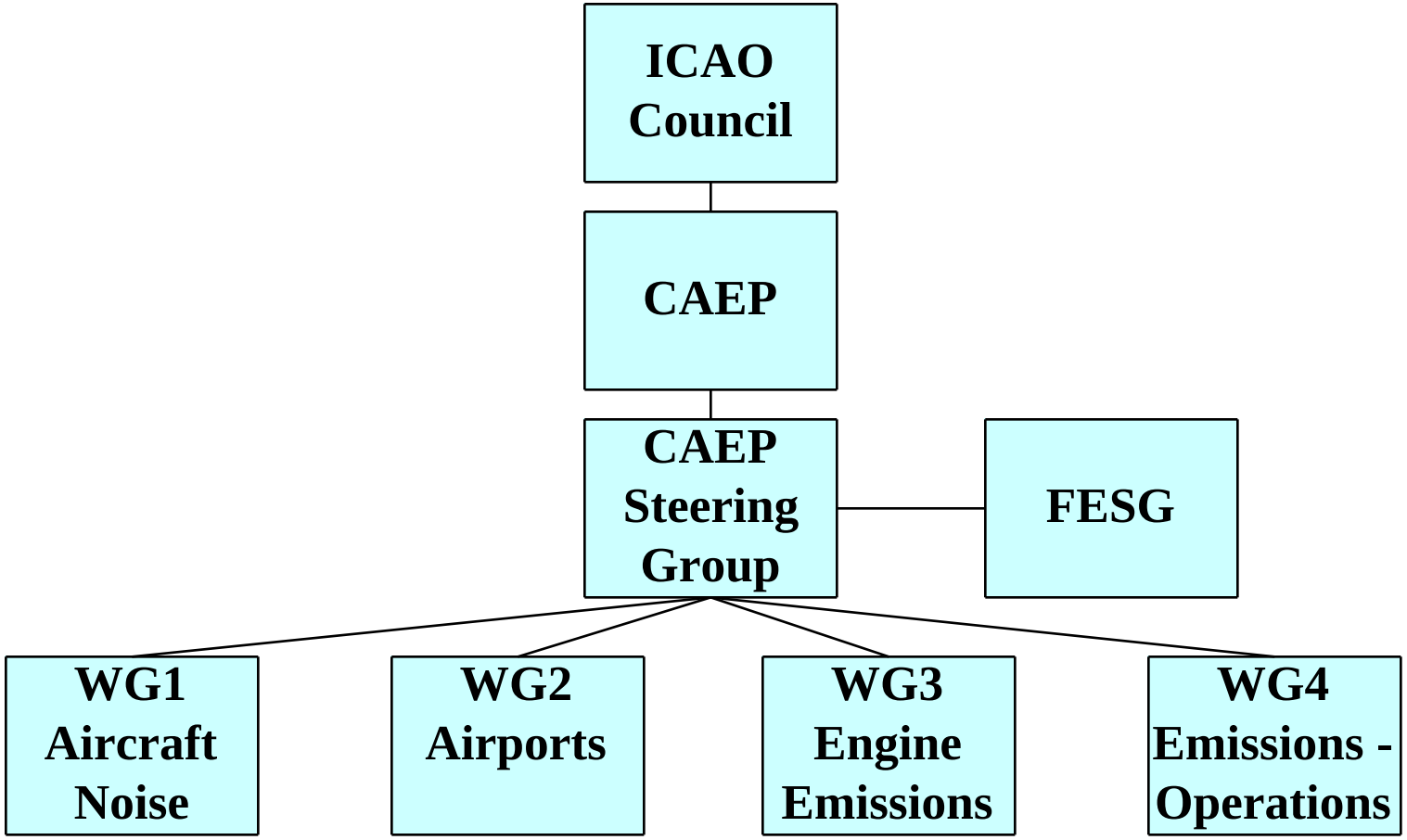
FAR part 36

- Noise standards and certification procedures
- Appendix C –transport and jet powered airplanes (“Stage 3”)
- Appendix G – propeller-driven small airplanes
- Appendix H -- helicopters
- Appendix J – alternative procedure for helicopters weighing not more than 6000 lbs.

ICAO Annex 16, Vol. I

- Standards and recommended practices
- Chapter 3 – subsonic jet and large propeller-driven aeroplanes
- Chapter 10 – propeller-driven light aeroplanes
- Chapter 8 -- helicopters
- Chapter 11 – helicopters not exceeding 2730 kg

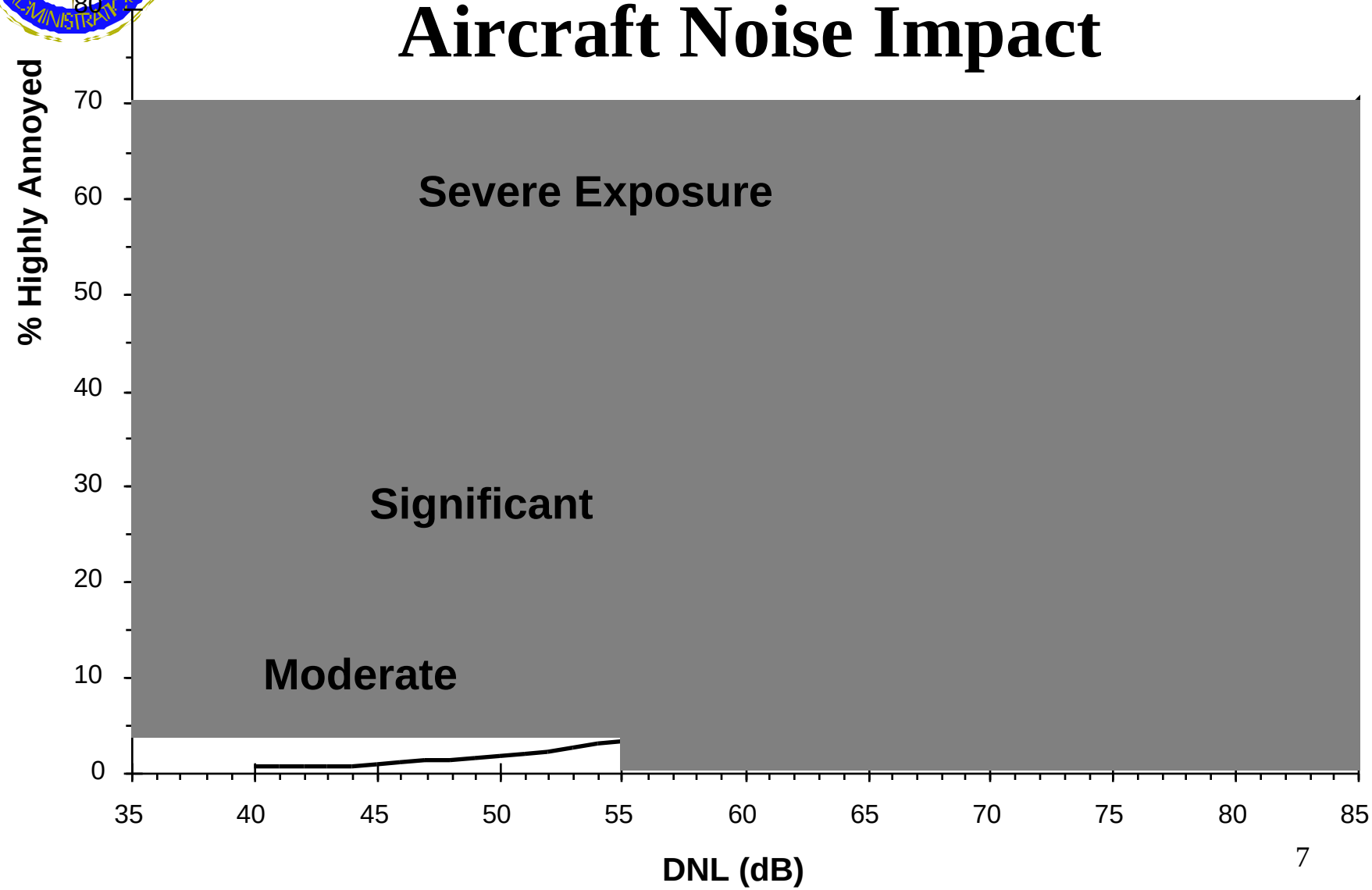
Committee on Aviation Environmental Protection (CAEP)



FAR part 150

- Aviation Safety and Noise Abatement Act of 1979
- Single system for measuring noise -- **DNL**
- Noise exposure maps -- **DNL 65,70,75 contours**
- FAA approved methodology -- **INM (or HNM)**
- Noise compatibility program -- **flight procedures, land acquisition, soundproofing,** ...

Aircraft Noise Impact



History of DNL

- **EPA ("Levels Document," 1974)**
  - DNL is best descriptor and outdoor level of 55 dB is requisite to protect public health and welfare
- **FICUN (*Guidelines for Considering Noise in Land Use Planning and Control*, 1980)**
  - With consideration to cost and feasibility factors, DNL 65 dB and higher is incompatible with residential land use.
- **FICON (*Federal Agency Review of Selected Airport Noise Analysis Issues*, 1992)**
  - Reaffirmed DNL with appropriate use of supplemental metrics.

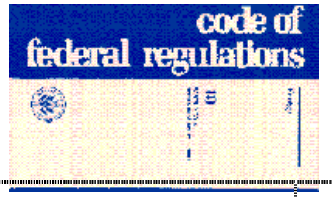
Noise Metric of Choice

Effect	DNL	AL	SEL	EPNL
Loudness		✓	✓	
Human annoyance response				✓
Duration	✓		✓	
Speech interference		✓		
Sleep disturbance	✓		✓	
Community annoyance	✓			
Public health and welfare	✓			

FAA's Environmental R&D Mission

- **Provide strong leadership in mitigating aviation's adverse impact on the public consistent with an effective aviation system.**
- **Apply R&D funds to the:**
  - advancement of abatement technology,
  - identification of appropriate environmental standards, and;
  - development of environmental assessment computer models.
- **Promulgate these environmental standards through the agency's statutory authority:**
  - Aircraft Noise Abatement Act of 1968
  - Noise Control Act of 1972
  - Airport Safety and Noise Abatement Act of 1979

"Regulatory Research"



Aircraft Noise Abatement Act of 1968	*control and abatement*	14 CFR part 36	· Measurement test procedures
Noise Control Act of 1972	*technologically feasible and economically reasonable*	14 CFR part 36	· Technology assessment
Airport Safety and Noise Abatement Act of 1979	*noise compatibility planning*	14 CFR part 150	· Airport noise exposure modeling · Compatibility criteria
National Environmental Policy Act of 1969	*environmental consequences of Federal actions*	40 CFR parts 1500-08	· Environmental analysis tools (models)

Partnerships

Unified Regulatory-R&D Approach to Source Control

End Product	Subsonic Jet	Light Prop	Helicopter	Tiltrotor	HSCT
Technology	**NASA** MOA	**NASA** MOA	**NASA** MOA	**NASA**	**NASA** MOA
Certification Procedures	**FAA**	**FAA**	**FAA**	**FAA**	**FAA**
Noise Standards	**FAA**	**FAA**	**FAA**	**FAA**	**FAA**

Active projects

Customer and Stakeholder Involvement

- **International Civil Aviation Organization (ICAO)**
  - Committee on Aviation Environmental Protection (CAEP)
- **Aviation Regulatory Advisory Committee (ARAC)**
  - FAR/JAR Harmonization
- **Federal Interagency Committee on Aviation Noise (FICAN)**
  - DOD, DOI/NPS, DOT/OST, EPA, HHS/CDC, HUD, and NASA
  - Public forums
- **Society of Automotive Engineers (SAE)**
  - Aircraft Noise (A-21)
  - Engine Emissions (E-31)
- **R,E&D Advisory Committee and Subcommittee**

Building FAA's Environmental Roadmap

- Limited resources
- Mission-critical investments
- Stakeholder imprint
- Unified regulatory-R&D approach
- "Three-legged stool" (source reduction, abatement procedures, and land use planning)
- "Win-win" between a safe, efficient aviation system and protection of public health and welfare